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Global status of biological diversity*

Report of the Secretary-General

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* The present report was prepared by the United Nations Environment Programme as task manager for chapter 15 of Agenda 21, with contributions from other United Nations agencies and international organizations. The report is a brief factual overview, which is intended to inform the Commission on Sustainable Development on key developments in the subject area.

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Introduction

1. Current conditions of global biodiversity are a cause of great concern. Despite the continued efforts of the international community, widespread biodiversity losses continue to occur and thus the status of biodiversity in terms of species, habitats and ecosystems has not significantly improved in most countries.

2. The present report reviews accomplishments and constraints in the area of biodiversity conservation and sustainable use including species, protected areas, and coral reefs, and presents issues for further consideration.

I. Achievements and constraints

A. Establishing the strategic framework for action

3. The Convention on Biological Diversity[1] has emerged as the principal instrument relevant to the implementation and achievement of the objectives of sustainable conservation and use of biological resources as stipulated in chapter 15 entitled "Conservation of biological diversity" of Agenda 21.[2] With its threefold objectives, namely, conservation, sustainable use, and the fair and equitable sharing of benefits derived therefrom, the Convention has provided a comprehensive and almost universal framework and process for synergy and collaboration among biodiversity-related multilateral environmental agreements (MEAs) and action plans.

4. The adoption of the Cartagena Protocol on Biosafety by the Conference of the Parties to the Convention, in its decision EM-1/3 of 29 January 2000,[3] was a major millennial milestone, the Protocol being the first global environmental treaty that operationalizes the precautionary approach to protecting biodiversity from the potential risks posed by living modified organisms (LMOs) resulting from modern biotechnology. It establishes an advanced informed agreement (AIA) procedure for ensuring that countries are provided with the information necessary to make informed decisions before agreeing to the import of LMOs into their territory. Its effective implementation will bring to the fore the complexity of the whole question of integrating biodiversity issues into international and national economies.

5. The Conference of the Parties to the Convention has launched comprehensive programmes of work addressing 5 critical ecosystem-based thematic areas and 13 cross-cutting issues. The Conference of the Parties decided that the ecosystem approach should be the primary framework for action to be taken under the Convention. The Convention defines an ecosystem as "a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit" (article 2). The adoption of the ecosystem approach (decision v/6) and the decision at the fifth meeting of the Conference of the Parties, held in Nairobi, to develop a strategic plan for the Convention (decision v/20) will greatly contribute to the establishment of a firm policy foundation.

6. Other biodiversity-related conventions and processes including the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES),[4] the Convention on the Conservation of Migratory Species of Wild Animals,[5] the Convention on Wetlands of International Importance, Especially as Waterfowl Habitat (RAMSAR Convention),[6] the Convention for the Protection of the World Cultural and Natural Heritage[7] meetings of regional seas conventions and the Global Biodiversity Forums have made significant contributions in specific areas of the sustainable management and use of the world's biodiversity.

7. The five-year review of the UNCED process (Earth Summit plus five), 1997; the Millennium Summit of the United Nations, 2000; and the first Global Ministerial Environment Forum, 2000, have given biodiversity the high-level political profile needed to galvanize action in favour of the conservation, and sustainable use of biological resources and the requisite benefit-sharing.

8. The restructuring of the United Nations Environment Programme (UNEP) and the strengthening of its role/mandate in the field of environment as per the Nairobi Declaration on the Role and Mandate of the United Nations Environment Programme[8] since the five-year review of the United Nations Conference on Environment and Development process has had a significant input on its work in the coordination, interlinkages and synergies among, and

support to, MEAs including biodiversity-related conventions and processes. The following meetings have been convened by UNEP in this regard:

- The Meeting to Assess the Need for a Second Interlinkages Assessment Report, Bonn, 26 October 1999. An offshoot of this meeting was the Millennium Ecosystem Assessment project;
- The First Consultative Meeting of the Subsidiary Scientific and Technical Bodies and Secretariats of Multilateral Environmental Conventions, Bonn, 25 and 26 October 1999;
- The Second Global Meeting of Regional Seas Conventions and Action Plans, The Hague, 5-8 July 1999;
- The Third Global Meeting of Regional Seas Conventions and Action Plans, Monaco, 6-10 November 2000;
- The Ninth Meeting on Coordination of Multilateral Environment Agreement Secretariats, Nairobi, 11 and 12 February 2001.

9. The preparation of national biodiversity strategies and action plans (NBS/APs) was among the significant achievements produced. With over 125 developing countries and countries with economies in transition in addition to the majority of developed countries, the next stage, namely, implementation of the NBS/APs, will greatly contribute to effective implementation of the Convention on Biological Diversity as well as the objectives of chapter 15 of Agenda 21.

10. The recognition and wide acknowledgement of the need for streamlining and harmonizing national reporting for all biodiversity-related conventions are another significant achievement. This will lead to improved monitoring of the effectiveness of measures adopted on various aspects of conservation and sustainable use of biodiversity.

11. Countries have experienced major constraints owing to lack of national capacities as a result of lack of adequate new and additional financial resources. This has led to unfulfilled expectations in key issues, such as transfer of technologies; equitable benefit-sharing mechanisms; rehabilitation and restoration of degraded ecosystems; and liability and redress.

B. Conservation and sustainable use of biodiversity

1. A global species extinction crisis

12. According to the 2000 International Union for Conservation of Nature and Natural Resources-World Conservation Union (IUCN) Red List of Threatened Species, the third wave of a major global species extinction crisis is emerging.[9] The Red List provides an excellent set of quantitative criteria for assessing the status of species and their habitats. The List has been recognized as the most comprehensive list of globally threatened species ever compiled. This is especially true if one also considers its companion volume, the 1997 IUCN Red List of Threatened Plants, which lists an extraordinary number (34,000) of species of plants.

13. The 2000 IUCN Red List highlights many species that could be lost in the first few decades of the twenty-first century if the global community does not greatly intensify its level of support, involvement and commitment. Specifically, the Red List:

- Highlights that the total number of listed species has increased dramatically in the last five years; for example, species of mammals have increased from 1,096 to 1,130 and species of birds from 1,107 to 1,183. The number of critically endangered species has also increased; for example, the number of critically endangered species of mammals has increased from 169 to 180 and the number of critically endangered species of birds, from 168 to 182. The global community should take the loss of species very seriously indeed;
- Includes 11,046 species threatened with extinction, 816 species that have already become extinct or extinct in the wild, and 4,595 species listed as being data-deficient or in the specific taxa or subpopulation-level assessments, totalling 18,276 taxa. The 11,046 species that are listed as threatened with extinction, although less than 1 per cent of the world's described species, include 24 per cent of all mammal species and 12 per cent of all bird species. In other words, one in every four mammal species and one in every eight bird species are facing a high risk of extinction in the near future. Approximately 25 per cent of reptiles, 20 per cent of amphibians and 30 per cent of fishes (mainly freshwater) are

listed as threatened. The 2000 Red List includes 5,435 animal species threatened with extinction compared with 5,205 in 1996;

- Highlights that the number of threatened inland water species has increased in all groups except for the molluscs. This indicates the extremely vulnerable nature of freshwater habitats. Species living in freshwater ecosystems are likely to be facing a much higher risk of extinction than their counterparts in the terrestrial and marine environments.

14. In order to gain an understanding of which habitats are the most important for threatened species, an attempt was made to identify/record the major habitats in which each threatened species occurred. Over 45 major habitats have been identified for this purpose under an eight-category hierarchical structure of the major threat types (that is to say, the major processes threatening biodiversity conservation and sustainable use). These include habitat loss, direct exploitation, indirect effects, natural disasters, atmospheric pollution, land/water pollution, intrinsic biological factors, and other miscellaneous (unspecified) factors.

15. From the IUCN Red List it is clear that the most pervasive and overriding threat to birds, mammals and plants is habitat loss and degradation, affecting 89 per cent of the threatened birds sampled, 83 per cent of the threatened mammals sampled and 91 per cent of the threatened plants sampled. The three primary causes of habitat loss are agricultural activities (including crop and livestock farming, and timber plantations), extraction activities (including mining, fisheries, logging and harvesting) and development (which includes human settlements, industry and all the associated infrastructure like roads, dams and power lines).

16. Two key threats to mammals are habitat fragmentation (6 per cent of all species) and deforestation (9 per cent of all species), both of which are due to unspecified causes. It is noteworthy that in an analysis of the threats faced by threatened species in the United States of America, habitat loss and degradation emerged as the greatest threat, affecting more than 80 per cent of threatened species.[10] Direct habitat loss and exploitation also have a major impact on birds (37 per cent of all threatened species), mammals (34 per cent of all threatened species) and plants (8 per cent of all threatened species). This category can be broken down into hunting and collecting activities and the impacts of legal and illegal trade. The breakdown shows that 338 threatened bird species (28 per cent of all species studied), 212 mammals (29 per cent of all species studied) and 169 plants (7 per cent of all species studied) are impacted by hunting and collecting. Trade impacts 13 per cent of threatened bird species and 13 per cent of threatened mammal species, while less than 1 per cent of the threatened plant species are impacted by trade.

17. Invasive species are also an important threat, affecting 350 species (30 per cent of all threatened bird species studied), and 361 species (15 per cent of all threatened plant species studied). This threat appears to have less impact on mammals, affecting only 69 species (10 per cent of all threatened mammal species studied). The extinction of most bird species since 1800, especially those on islands, is largely attributed to the introduction of alien invasive species.[11] Therefore, it is alarming to note that 30 per cent of threatened bird species studied are currently being affected by invasive species.

18. Comparing the top six most important habitats for threatened birds and mammals, five of these habitats are common to both birds and mammals. There is complete agreement on the top two habitats for both groups, namely, lowland and mountain tropical rainforest. The analysis of the bird habitats by BirdLife International indicates that threatened birds are highly habitat-restricted with 883 species (74 per cent of threatened bird species) almost entirely dependent on a single habitat type. Of these, 75 per cent are dependent on forests. More than 900 threatened bird species use tropical rainforests and 42 per cent of these are found in lowland rainforest while 35 per cent occur in mountain rainforests.[12]

19. A further 4,595 species are on the brink of moving into one of the threatened categories unless something is done soon to reverse their continued population decline. Apart from the sheer numbers of species listed as being threatened or potentially threatened, the rapid movement of many species of mammals and birds through the threatened categories towards being critically endangered in just the last four years is extremely alarming. Human activities are the cause of this deteriorating situation, which is increasingly being referred to as the global extinction

crisis. The global community has the responsibility and the ability to reverse the situation. To do so will take both knowledge and commitment.

2. Global protected areas network

20. It is a widely held view that protected areas are the most effective means of in situ conservation of biological diversity. Conservation biologists advocate that protected areas should be as large as possible in order to maximize the degree to which their contents retain their integrity; minimize risks of species' extinction; and maximize representation of ecological communities and their constituent species.

21. A World Conservation Monitoring Centre (WCMC) publication indicates that the number and extent of the global network of protected areas (PAs) have grown steadily throughout the latter part of the twentieth century.[13] The world's network of 30,350 protected areas extends over a total of 13,232,275 square kilometres (km^2) which represents 8.83 per cent of the total land area. The network is extensive from a global perspective but there are many gaps at the national level. The number of protected areas established declined somewhat in the five-year period 1990-1994 as compared with the previous decade. However, there is little or no evidence of any decline in the rate of growth in the extent of this network during the most recent five-year period 1995-2000. This indicates that there are continuing efforts by Governments to establish new protected areas.

22. It is not yet possible to quantify precisely the marine and terrestrial components of the global network of PAs. However, the two largest "marine" protected areas are Greenland National Park (972,000 km^2) which is largely terrestrial and the Great Barrier Reef Marine Park (344,800 km^2) which is predominantly marine in character.

23. A number of protected areas have also been established under private and other non-governmental initiatives. A pilot study by WCMC indicates that private initiatives contribute significantly to in situ biodiversity conservation in many parts of the world.[14] The pilot study was limited to countries in Eastern/Southern Africa, where private protected areas in Kenya, Namibia, South Africa and Zimbabwe are contributing 1 to 7 per cent of total land area in the countries concerned, thereby constituting larger areas than the legally designated protected areas managed by government agencies. The extent of private protected areas in other parts of the world is presently non-quantifiable, but it is likely to be significant, particularly in the Americas and Europe. WCMC is planning to extend its Protected Areas Database to include the private sector in order to obtain a comprehensive cross-sectoral picture of the global network.

24. The United Nations Educational, Scientific and Cultural Organization (UNESCO) Man and the Biosphere Reserves Programme has made a significant contribution to biodiversity conservation, its sustainable use and the sharing of benefits derived therefrom. This interdisciplinary programme of research and training within the natural and social sciences has promoted a more effective use and conservation of the resources of the biosphere, and improved the global relationship between people and the environment. It is based on the creation and management of a biogeographically representative network of biosphere reserves, where, through appropriate zoning and management mechanisms, the conservation of ecosystems and their biodiversity is integrated with the sustainable use of natural resources for the benefit of local communities, including relevant research, monitoring, education and training activities.

3. Coral reefs

25. Coral reefs are among the most biologically diverse ecosystems on our planet, and also some of the most ancient. Although they occupy less than one quarter of 1 per cent of the marine environment, coral reefs are home to more than a quarter of all known marine fish species. Globally, more than 400 marine protected areas contain coral reefs; however, at least 40 countries lack any marine protected areas for conserving their coral reef ecosystems.

26. *The Reefs at Risk* report, 1998, has estimated that as much as 58 per cent of the world's coral reefs are at high or medium risk from human impact.[15] The worst threats include overexploitation and destructive fishing techniques, coastal development, inland pollution and sedimentation and marine-based pollution. Lately, coral bleaching has been added to the list. Alarmingly, the reefs in South-East Asia, noted for their extraordinary high levels of biodiversity, are also among the most threatened.

27. The *Status of Coral Reefs of the World: 2000 Report* confirms that the world's coral reefs continue to decline.[16] In the report, it is predicted that over half of the coral reef areas may be lost in 30 years, if efforts to conserve them are not enhanced. To halt and eventually reverse the global degradation of coral reefs, Governments and international agencies have jointly initiated the International Coral Reef Initiative (ICRI), which issued an international call for coral reef conservation.

4. Global biodiversity monitoring

28. It should be observed that, to date, biodiversity assessment activities are mainly static assessments, that is to say, status inventory. Trends and rate of change (trend assessment), particularly at the ecosystem level, are more crucial in determining long-term sustainability. A well-coordinated and structured biodiversity monitoring programme would greatly contribute to improvements of effective management, secure the integrity of existing protected areas and provide information for creation of corridors connecting small and/or key protected areas.

II. Issues for further consideration

29. The conservation and sustainable use of biodiversity remain a challenge to all stakeholders in all countries. They need to be an integral part of local and national strategies aimed at promoting sustainable development, addressing, among other things, the integration of biodiversity issues into all sectors, access to biodiversity and to relevant technology, compatibility of conservation and sustainable use including benefit-sharing mechanisms, utilization of aquatic, marine, coastal and terrestrial biological and genetic resources, and the application of the precautionary approach as stipulated in the Cartagena Protocol on Biosafety.

30. The global extinction crisis remains among the highest priorities for the global community in the decades to come. It would be important to regularly update and share the IUCN Red List and encourage countries to contribute relevant information.

31. The development of a coordinated biodiversity monitoring programme, which would provide adequate qualitative and quantitative information in support of policy development and decision-making on the conservation and sustainable use of biological resources, is urgently required.

32. There is need for greater international cooperation and collaboration among global and regional MEAs. Due regard should be paid to the recognition of the sovereign rights of States.

33. The level of support and commitment to biodiversity conservation, its sustainable use and equitable access and benefit-sharing mechanisms needs to be increased. In this regard, available basic biodiversity knowledge and information need to be linked and improved, so that they can be used by planners and decision makers to establish priorities and prevention measures and to take appropriate remedial actions.

Notes

[1] See United Nations Environment Programme, *Convention on Biological Diversity* (Environmental Law and Institution Programme Activity Centre), June 1992.

[2] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, vol. I, *Resolutions Adopted by the Conference* (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

[3] See UNEP/CBD/EXCOP/1/3 and Corr.1, part two, annex.

[4] United Nations, *Treaty Series*, vol. 993, No. 14537.

[5] Ibid., vol. 1651, No. 28395.

[6] Ibid., vol. 996, No. 14583.

[7] Ibid., vol. 1037, No. 15511.

[8] *Official Records of the General Assembly, Fifty-second Session, Supplement No. 25* (A/52/25), annex, decision 19/1, annex.

[9] The World Conservation Union (IUCN) Species Survival Commission, *2000 IUCN Red List of Threatened Species* (Margate, United Kingdom, Thanet Press, Ltd., 2000), compiled by C. Hilton-Taylor, IUCN.

[10] D. S. Wilcove and others, "Leading threats to biodiversity: what's imperilling U.S. species", In *Precious Heritage: The Status of Biodiversity in the United States*, B. A. Stein, L. S. Kutner and J. S. Adams, eds. (Oxford and New York, Oxford University Press, 2000).

[11] BirdLife International, Threatened Birds of the World, (Barcelona and Cambridge, United Kingdom, Lynx Edicións and BirdLife International, 2000).

[12] Ibid.

[13] B. Groombridge and M. D. Jenkins, *Global Biodiversity: Earth's Living Resources in the 21st Century* (Cambridge, United Kingdom, World Conservation Monitoring Centre (WCMC), World Conservation Press, 2000).

[14] Ibid.

[15] World Resources Institute (WRI), International Center for Living Aquatic Resources Management (ICLARM), International Coral Reef Initiative (ICRI), World Conservation Monitoring Centre (WCMC) and United Nations Environment Programme (UNEP), *The Reefs at Risk: A Map-based Indicator of Threats to the World's Coral Reefs* (Washington, D.C., 1998).

[16] Clive Wilkinson, ed., *Status of Coral Reefs of the World: 2000* (Cape Ferguson, Australia, Global Coral Reef Monitoring Network (GCRMN)/Australian Institute of Marine Science, 2000).